

AVERAGE 1979-81 WATER-TABLE ALTITUDES
HYDROLOGIC MAPS OF OGALLALA AQUIFER, WEST-CENTRAL KANSAS, 1979-81

By
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INTRODUCTION

Continuing studies are being made in west-central Kansas to derive new methods for effectively managing ground water for irrigation. This report, prepared in cooperation with the Western Kansas Groundwater Management District No. 1, presents the results of a study that uses a method for producing hydrologic maps used as management tools.

A mathematical technique, called kriging, has been used in the form of a computer program to interpolate hydrologic data based on a network of measured values (Dunlap and Spinazola, 1980). The technique has been applied to geohydrologic data in west-central Kansas (Dunlap and Spinazola, 1981b). The program generates estimated values at the center of each 1-mile section in the Western Kansas Groundwater Management District and facilitates contouring of selected hydrologic data.

This report includes maps generated by the kriging technique that illustrate hydrologic conditions in the Ogallala aquifer, the principal source of water in west-central Kansas. Maps of the aquifer, using a 1-year average, include the water-table altitudes (sheet 1 of 4), the 1979-81 saturated thicknesses (sheet 3 of 4), and the percentage change in saturated thickness from 1950 to 1979-81 (sheet 4 of 4). A map showing contours of the water-table surface (sheet 2 of 4) also is provided as a measure of reliability for the 1979-81 water-table altitudes.

AVERAGE 1979-81 WATER-TABLE ALTITUDES

A map of water-table altitudes in the Ogallala aquifer was constructed by using annual measurements from a network of observation wells to interpolate estimates at the center of each 1-mile section. As specified by the Management District, a 3-year moving average of the annual water-level measurements, made in mid-winter, was used to minimize the local effect of seasonal fluctuations from one well or from nearby wells. Thus, estimated 1979-81 water-table altitudes were plotted at the center of each 1-mile section in the Management District and facilitate contouring of selected hydrologic data.

Average 1979-81 water-table altitudes in the Management District range from about 3,700 feet in the west to about 2,500 feet in the east. The gradient of the water table generally averages about 12 feet per mile. A few local depressions in the water-table surface indicate that intensive pumping for irrigation may have temporarily altered the general gradient.

CONVERSION FACTORS

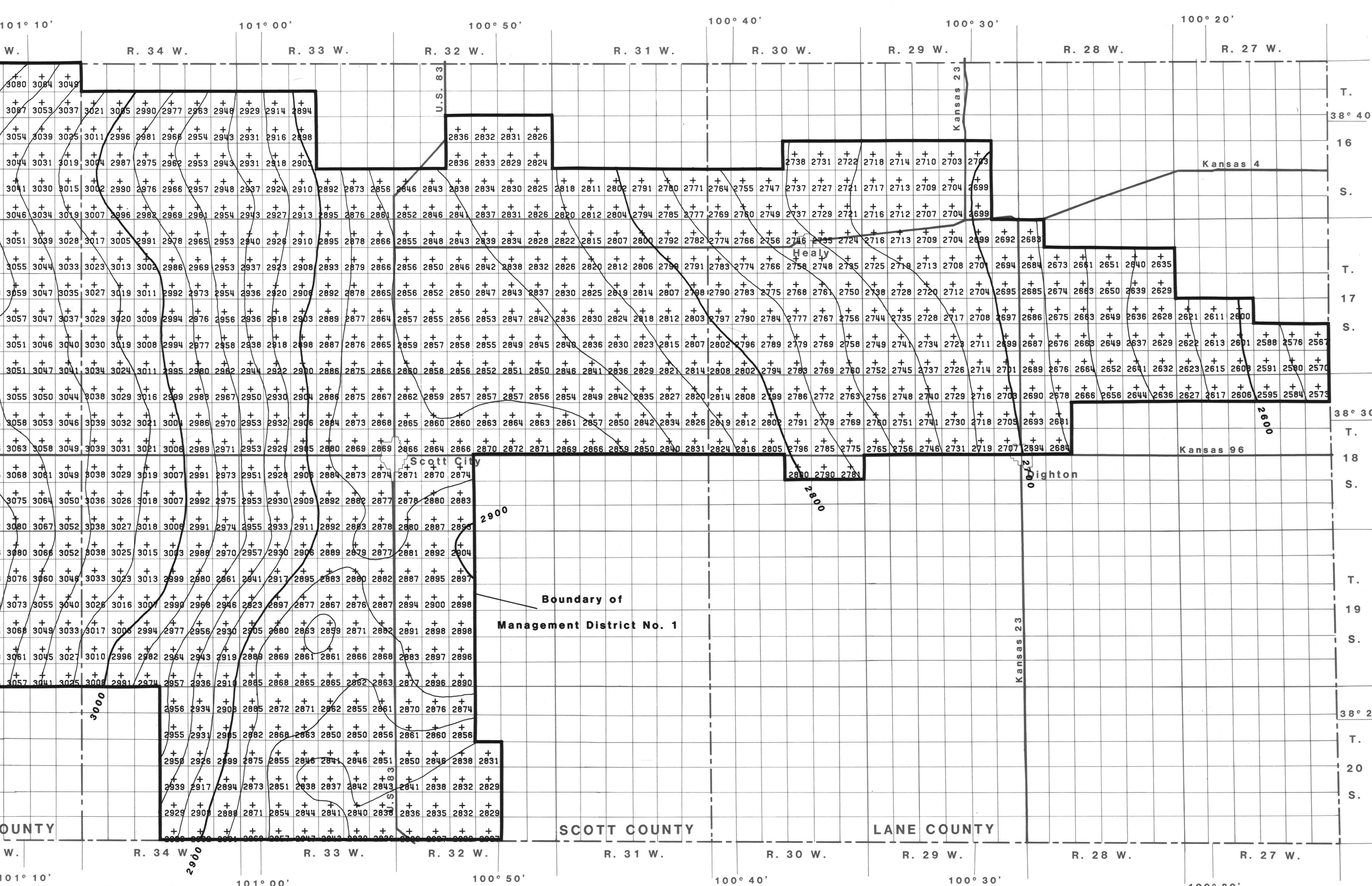
For those readers who may prefer to use the metric system rather than the inch-pound units used in this report, the conversion factors for the International System (SI) of units are listed below:

To convert from	inch-pound units	To	Multiply by
Foot	meter	meter	0.3048
Foot per mile	kilometer	kilometer	1.609
Foot per mile	meter per kilometer	meter per kilometer	0.1894

— 3500 — WATER-TABLE CONTOUR--
Shows altitude of average
1979-81 water table. Contour
Interval 20 feet

— 2852 — DATA POINT--Shows inter-
polated altitude of average
1979-81 water table, in
feet

National Geodetic Vertical Datum of 1929



0 2 4 MILES
0 2 4 KILOMETERS